TECTON: DEVELOPMENT OF A tcl/tk FRONT-END EDITOR. David Friedman[1] and Frederick Suppe[2], History and Philosophy of Science (CHPS), 1102 Skinner, University of Maryland, College Park, MD 20742 dfriedmn@wam.umdd.edu, [2]CHPS/Philosophy, 1102 B Skinner, University of Maryland, College Park, MD 20742, and Department of Geological Sciences, Indiana University, Bloomington, IN 47405 suppe@carnap.umd.edu, fsuppe@indiana.edu.

Comparative planetology investigates similarities and differences between various terrestrial planets and satellites. For those few that are geologically active a concern is whether subductive processes presently are active or previously have occurred. Remote sensing data only provides indirect evidence, and so the primary strategy is to use such data as boundary conditions constraining simulation modeling investigations of possible subductive scenarios. Such investigations are especially crucial for understanding the resurfacing history of Venus and even have been the focus of AGU Special sessions.

Finite-element modeling has proved the most powerful technique for simulated investigation of subduction and associated corona relaxation scenarios. Pioneering efforts by Melosh and Raefsky led to the development of TECTON, Jay Melosh's finite-element FORTRAN program which, while not public domain, generously has been lent to the geoscience community for investigation of earth and planetary subductive scenarios.

TECTON has proved to be a valuable work-horse, but it is less than user-friendly. Of particularly complexity is setting up the basic grid structures during the modeling. Melosh long has hoped for time and resources to make TECTON more user- friendly. Efforts by others to enhance the basic grid-structure set-up have not been generalizable.

Motivated by the desire to adapt TECTON into a teaching tool for use by undergraduates to investigate subductive scenarios for Venus, we have begun development of a GUI front-end for TECTON that converts it into a user-friendly learning tool for unsophisticated undergraduates to investigate subduction scenarios on Venus constrained by Magellan and Venera data sets. Jay Melosh has been supportive and encouraging in our efforts.

Our efforts involve the development of a three-tiered front-end: Level 1 is a sophisticated graphic-interface editor for setting up finite-element scenarios in TECTON. Level 2 adds to this a repertoire of archived standard scenarios for using TECTON to model subductive and relaxation scenarios. The basic set can be augmented through archiving templates created using the level 12 editor. Level 3 adds a tutorial-interface aimed at unsophisticated students that exploits level two templates and guides them through the investigation of realistic subductive scenarios for Venus and other terrestrial bodies. Our design goals are that the median time for students to be able to use our special front-end version of TECTON to do real science be 10 minutes.

As of December, 1996, we have level 1 in stable beta version. By the time of LPSC we expect to have beta versions of levels 2 and 3 operational. Level 3 utilization will be demonstrated as part of a Special Session" Education" poster/display. Of necessity, it will demonstrate level 1 and 2 capabilities as well.

Level 1 is, of course, most important for enhancing the usability of TECTON as a research tool. We expect to have illustrations of its effectiveness that embody TECTON scenarios for Venus subductive modeling and relaxation modeling. (Planetary scientists will be able to gain hands-on experience with our level 1-3 embellishments of TECTON in our associated special poster/displays at the Tuesday and Thursday special sessions on education.)

One goal of our poster presentation is that we obtain from past, present, and potential users of TECTON helpful feedback that will enable our stage 1 and 2 developments to optimize the usability of TECTON as a research tool.